

The Gaussian core model in high dimensions

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We give lower bounds on an energy defined by a Gaussian pair potential for configurations in Euclidean space with a fixed number of points per unit volume. If the potential is not too steep, then our bound shows that, as the dimension increases, the energy achieved by a typical lattice comes arbitrarily close to the minimal energy. The limiting case of a very steep potential is related to sphere packing.

This project is joint with Henry Cohn. Our proof is based on the linear programming method.